

## 02/11/14 Agenda

- Warm up exercise
- Section 6.4 - Application of Linear Systems
- Homework
  - Worksheet 6-4 - Applications of Linear Systems

## Warm Up

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Determine the best method for solving each system.  
You do not need to solve them!

1)

$$\begin{array}{r} 8x - y = 20 \\ + -5x + y = -8 \\ \hline \end{array}$$

$$3x = 12$$

ELIMINATION

2)

$$y = 3x + 3$$

$$2x + y = -7$$

SUBSTITUTION

$$2x + (3x + 3) = -7$$

3)

$$3(2x - 3y = -11)$$

$$2(-3x + 4y = 16)$$

ELIMINATION

$$\begin{array}{r} 6x - 9y = -33 \\ -6x + 8y = 32 \end{array}$$

Why?	To solve real-life problems, it is often necessary to write a system of equations.
Word problems:	<p>Steps:</p> <ol style="list-style-type: none"> <li>1) Define 2 variables.</li> <li>2) Write 2 equations using the variables and the given information.</li> <li>3) Solve using one of the methods you have learned.</li> </ol>
Examples:	<p>1) <u>The sum of two numbers is 27.</u> <u>The larger number is 3 more than the smaller number.</u> What are the 2 numbers?</p> <p> <math>12 = X = \text{SMALLER \#}</math>  <math>15 = Y = \text{LARGER \#}</math> </p> <p> <math>X + Y = 27</math>  <math>Y = X + 3</math> </p> <p> <math>Y = 12 + 3</math>  <math>Y = 15</math> </p> <p> <math>X + (X + 3) = 27</math>  <math>2X + 3 = 27</math>  <math>\quad \quad \quad -3 \quad \quad \quad -3</math>  <hr/> <math>2X = 24</math>  <math>\quad \quad \quad \underline{2} \quad \quad \quad \underline{2}</math>  <math>X = 12</math> </p>

Examples:

- 2) During a sale you buy 3 sweatshirts and 2 sweatpants for \$85.50. A week later you buy 3 more sweatshirts and 4 more sweatpants for \$123. How much do each cost?

$$\begin{array}{rcl}
 \$16.00 = S & = \text{SHIRTS} & 3S + 2P = 85.50 \\
 \$18.75 = P & = \text{PANTS} & -(3S + 4P = 123.00) \\
 \hline
 & & -2P = -37.50 \\
 & & \underline{-2} \quad \underline{-2} \\
 & & P = 18.75
 \end{array}$$

$$\begin{array}{rcl}
 3S + 2P & = & 85.50 \\
 3S + 2(18.75) & = & 85.50 \\
 3S + 37.50 & = & 85.50 \\
 \underline{-37.50} & & \underline{-37.50} \\
 3S & = & 48.00 \\
 \underline{3} & & \underline{3} \\
 S & = & 16
 \end{array}$$

- 3) You have a jar with nickles and quarters in it. You empty the 75 coins into a Coinstar machine. It tells you the total is \$9.35. How many of each coin did you have?

$$\begin{array}{rcl}
 Q + N & = & 75 \\
 0.25Q + 0.05N & = & 9.35 \\
 \underline{-0.05N} & & \underline{-0.05N} \\
 4(.25Q) & = & 9.35 - .05N \\
 Q & = & 37.40 - .20N \\
 Q + N & = & 75 \\
 37.40 - .20N + N & = & 75 \\
 37.40 + .8N & = & 75 \\
 \underline{-37.40} & & \underline{-37.40} \\
 .8N & = & 37.60 \\
 \underline{.8} & & \underline{.8} \\
 N & = & 47
 \end{array}$$

Examples:

- 2) During a sale you buy 3 sweatshirts and 2 sweatpants for \$85.50. A week later you buy 3 more sweatshirts and 4 more sweatpants for \$123. How much do each cost?

$$\begin{array}{rcl}
 16.00 = & S & \\
 18.75 = & P & 
 \end{array}$$

$$\begin{array}{r}
 3s + 2p = 85.50 \\
 - (3s + 4p = 123.00) \\
 \hline
 -2p = -37.50 \\
 \frac{-2}{-2} \quad \frac{-37.50}{-2} \\
 p = 18.75
 \end{array}$$

↓

$$\begin{array}{r}
 3s + 2p = 85.50 \\
 3s + 2(18.75) = 85.50 \\
 3s + 37.50 = 85.50 \\
 \frac{-37.50}{-37.50} \quad \frac{-37.50}{-37.50} \\
 \hline
 3s = 48.00 \\
 \frac{3s}{3} = \frac{48.00}{3} \\
 s = \$16.00
 \end{array}$$

## 6.4 - Applications of Systems of Equations

Target 6C

February 11, 2014

Examples:

- 3) You have a jar with nickles and quarters in it. You empty the 75 coins into a Coinstar machine. It tells you the total is \$9.35. How many of each coin did you have?

$q = \# \text{ QUARTERS}$

$$n + q = 75$$

$n = \# \text{ NICKLES}$

$$.05n + .25q = 9.35$$